

PURDUE AGRICULTURAL ECONOMICS REPORT

YOUR SOURCE FOR IN-DEPTH AGRICULTURAL
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2018 AGRICULTURAL OUTLOOK

DECEMBER 2017

CONTENTS	Page
Strong U.S. Economy: But a Lid on Growth	<u>2</u>
Trade: NAFTA Uncertainty Looms Over U.S. Ag	<u>3</u>
Farm Policy: Perspectives on the New Farm Bill	<u>6</u>
Low Farm Prices Contribute to Modest Food Price Changes	<u>8</u>
Beef Supply to Rise: Can Strong Demand Hold Cattle Prices?	<u>9</u>
Dairy: “Butter” Hold On: Tight Margins Continue!	<u>11</u>
Pork Industry Favored by Strong 2018 Demand	<u>12</u>
Corn Prices Depressed by Large Inventory	<u>13</u>
Soybeans Pay Bills With Friendly Price Tone	<u>14</u>
2018 Purdue Crop Cost & Return Guide	<u>15</u>
Cash Rents: Pressure is Downward	<u>17</u>
Farmland Value Outlook	<u>18</u>

EDITOR’S WELCOME NOTE

Welcome to our outlook issue for agriculture in 2018. Agriculture is continuing to go through adjustments after a boom period from 2008 to 2013. During that boom, Indiana farm incomes averaged near \$3 billion per year. In the most recent three years, incomes have dropped to an annual average around \$1.5 billion—a 50% decline.

Continued adjustments in 2018 are expected with little improvement in incomes. The 2017 U.S. corn and soybean crops were large and inventories are high. Prices are expected to be somewhat lower and Indiana revenues from crop production will likely be down, especially for soybeans due to lower yields and lower prices. Corn inventories are particularly large and prices for the 2017 crop are expected to be at the lowest level in 11 years. Futures markets anticipate some improvement in grain and soybean prices for the 2018 crops, but that is still another growing season away.

Grain margins are expected to be tight and even negative for some for 2018 crops. Tight grain margins along with higher interest rates could put additional downward pressure on farmland values. Producers will need to continue driving

costs per bushel lower. Some further progress is expected in 2018 in lowering overall costs per bushel including cash rents.

The animal sector will continue to expand with the low feed prices. That will be 1% to 3% depending on species. Even with more supply, prices may not drop much due the strong economic growth expected in both the domestic and export markets.

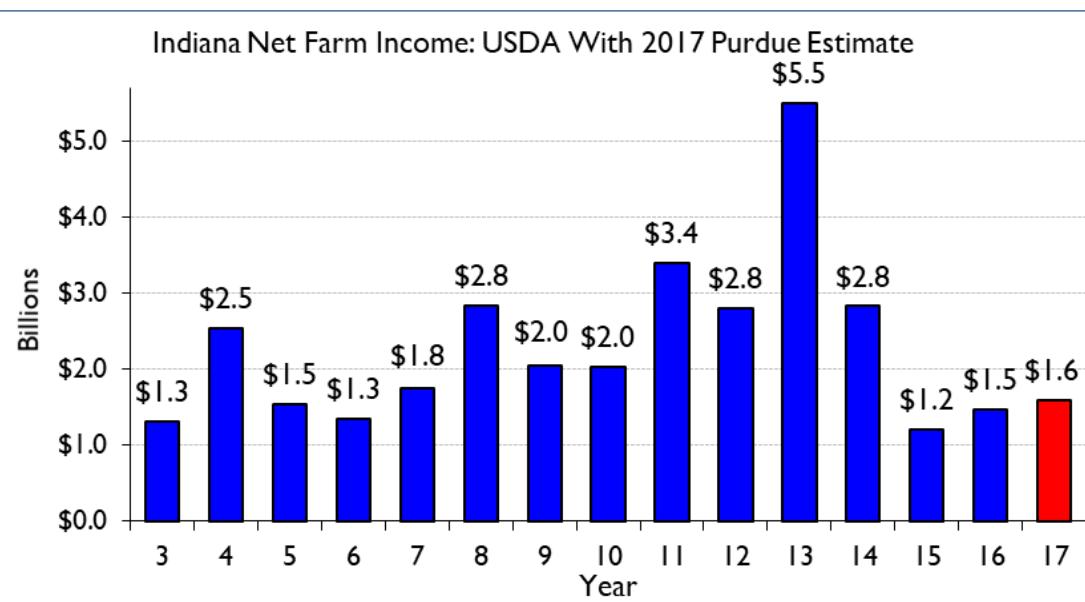
Beef cattle and milk prices may drop modestly, hog prices are expected to be near unchanged, and egg and turkey prices are expected to increase modestly. Incomes for the animal

sector are expected to be modest and similar to 2017 for Indiana. Margins for the dairy sector will remain tight.

2018 will be the fourth year of reduced incomes. Some further deterioration of the financial positions on most farms is expected. Cash flow is tight and lower land values will continue to erode some equity. Indiana farm families generally came into the downturn with very strong financial positions built up during the boom, so most are working with their agricultural lenders to bridge the downturn until sufficient adjustments are made to lower costs or see prices improve.

Get all the details by reading these articles from Purdue experts!

- Chris Hurt, Editor and Professor of Agricultural Economics



STRONG U.S. ECONOMY: BUT A LID ON GROWTH

LARRY DEBOER, PROFESSOR OF AGRICULTURAL ECONOMICS

The United States economy has reached full employment. The November unemployment rate was 4.1%. Most people who want to work are working. There are only 1.1 unemployed people per job opening, the same ratio as at the end of the long 1990's expansion. Most people who are looking for work will find a job soon.

An economy can grow faster if it has unemployed people, and if it has vacant buildings and unused equipment. If someone wants to buy what businesses and their employees can produce, new jobs are created and there are people to fill them. Businesses expand into available space and begin using available equipment. Output increases.

On the other hand, an economy at full employment is likely to grow more slowly. There may be no one available to

fill the new jobs that businesses create. The number of people newly entering the labor force, minus the people who drop out or retire, puts a limit on job growth. An entrepreneur may have a great business idea, but no empty space to rent. Space becomes available only when construction companies and their workers build new buildings. A factory operating at maximum capacity may have to refuse an order until new equipment is manufactured and new employees arrive.

Full employment limits our economy to the growth of the labor force plus the growth of the tools and technology that workers use. Between 1980 and 2008, when the baby boomers were all old enough to work but too young to retire, the labor force grew 1.3% per year. Now baby

boomer retirements are a drag on labor force growth. Since 2008, the labor force has grown only 0.4% per year. Over the past year, growth has been a little faster, at 0.8%.

Labor productivity is growing slowly too. It can be measured by the value of goods and services that the average worker produces. Productivity had a burst of growth between 1996 and 2005, as new information technology came into use. Output per worker grew 2.1% per year. Lately productivity growth has slowed. Since 2005, it has grown only 0.8% per year.

Add it up! Recent labor force growth of 0.8% plus productivity growth of 0.8% means that the economy's capacity can grow only 1.6% per year.

What if consumers, or businesses, or governments, or the rest of the world try increasing their spending on goods and services at a pace above 1.6% per year? Then something has to give. Businesses might raise wages, to attract people from retirement or out of the home. Labor force growth would increase. Businesses might invest in new machinery or technology. Productivity would increase. Businesses might offer training to less-qualified people. The unemployment rate would fall some more. Businesses might raise prices to offset cost increases, or simply because strong demand allows them to. Inflation would increase.

All of these things could happen in 2018. Consumer spending has increased 2.6% over the past year. With jobs available, stock and home prices rising and consumer confidence high, spending should continue to grow. Investment spending growth has been modest, 4.6% over the past year. Capital goods orders are rising, so equipment investment may increase. Home prices keep climbing and building permits are edging upward, so we may see more home construction. With corporate interest rates still near record lows, investment spending should increase more rapidly.

Congress may pass a tax cut. Perhaps new investment will increase productivity and the economy's capacity, but that is unlikely to happen as soon as 2018. Added after-tax in-

come surely will add to spending, though.

Expect real gross domestic product to grow 2.2% over the next year, the same as the average since the Great Recession ended. That is above the 1.6% capacity limit, so both the labor force and productivity will have to grow a little faster to meet added demand. The unemployment rate may fall a little, to 4.0% by this time next year, or perhaps a tenth or two lower.

Added spending at full employment should cause inflation to rise. The all-items "headline" inflation rate has been 2% over the past year. The "core" inflation rate not counting energy or food has been 1.8%. Expect them both to be above 2% next year — say 2.3%.

The Federal Reserve has been waiting for this inflation, and wondering why it has not yet appeared. In 2018, it will, so look for four one-quarter-point increases in the federal funds rate over the next year. The new Fed chair, Jerome Powell, will look comparatively active. The 3-month Treasury bill yield should rise from 1.3% now to 2.3% next December. The ten-year Treasury bond rate will rise about half-a-point, to 2.8%.

Here's news: this forecast will be wrong. Will it be just a little wrong, so that the story it tells is mostly right? Or a lot wrong, because of shocks to spending or productivity? Shocks are called shocks because they are unpredictable, but here are some possibilities:

1. Debt problems in China could upset financial markets.
2. Brexit uncertainty could slow growth in the U.K. and Europe, more so if Germany has trouble choosing a chancellor.
3. Brinksmanship in Congress over raising the debt limit could upset financial markets too. If there is no tax cut, inflation and interest rates will be lower.

Assuming we are not shocked, though, expect another year like last year, and the year before that, and the year before that. We should see somewhat higher inflation and interest rates, somewhat lower unemployment, and steady GDP growth.

TRADE: NAFTA UNCERTAINTY LOOMS OVER U.S. AG

RUSSELL HILLBERRY, ASSOCIATE PROFESSOR OF AGRICULTURAL ECONOMICS

USDA is expecting the value of agricultural exports to remain stable at \$140 billion in 2018. Relatively small adjustments are expected in most Ag products. On a vol-

ume basis, wheat and corn exports are expected to be down, but higher volumes are expected for soybeans (record exports), soybean meal, beef, pork and chicken.

U.S. Ag exports are expected to be supported by somewhat faster world economic growth in 2018. The value of the U.S. dollar declined during much of 2017 and is expected to be stable to down slightly in 2018. Any weakness in the dollar would be a potential supportive factor for U.S. exports.

The biggest trade issue for 2018 however, is the ongoing renegotiation of the North American Free Trade Agreement (NAFTA). Most agricultural producers will have something at stake in these talks, but corn-growers and poultry producers should be especially interested in seeing a successful conclusion of the negotiations. Figure 1

shows Mexican and Canadian shares of US exports over time for Corn, Soybeans, Pork and Poultry products. Trade shares are useful for evaluating regional trading arrangements because they show changes relative to the rest of the world. US exports in corn and poultry products have seen sizable shifts towards NAFTA markets, especially Mexico. These shifts could be reversed if NAFTA collapses.

How many dollars of exports are at stake? Consider the 2016 exports in U.S. dollars shown in Table 1. Among these four product groups, US exports approached \$8 billion in export value. Corn is the most significant U.S. export item under NAFTA rules, followed by pork products, soybeans and poultry. Total exports of agriculture and related products to our two NAFTA partners totaled \$43

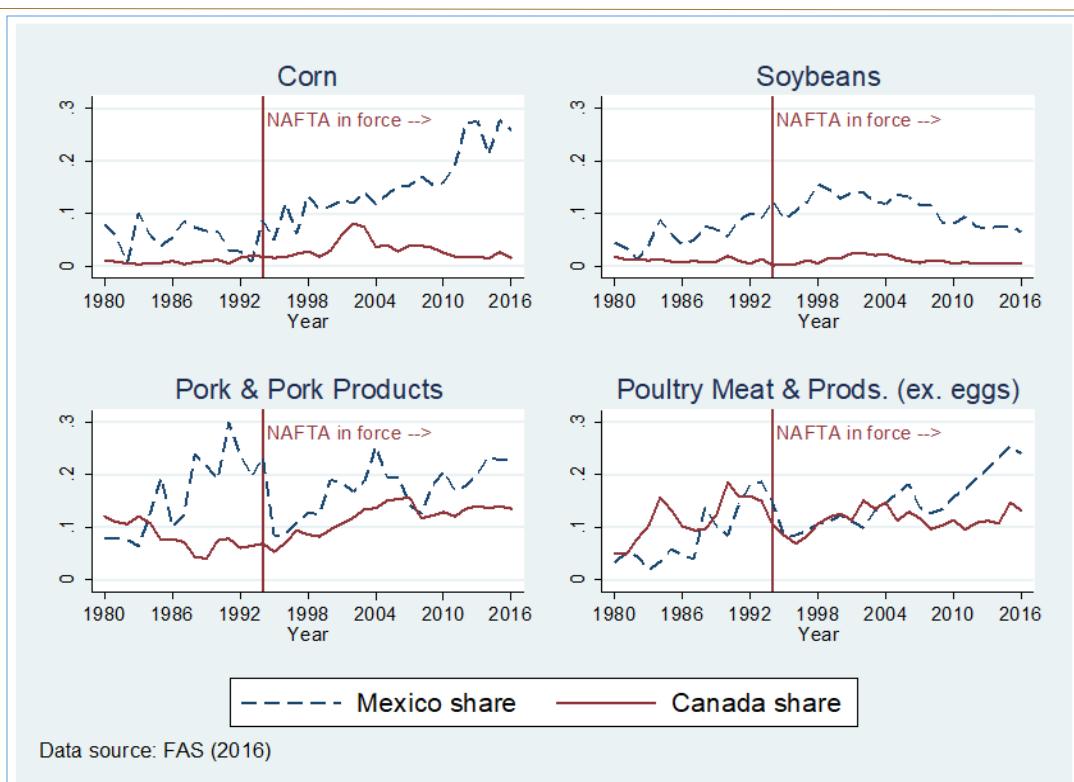


Figure 1. Canadian and Mexican shares of U.S. exports over time

billion in 2016.

A USDA report (Zahniser et al., 2015) offers a comprehensive review of “NAFTA at 20.” The report highlights a number of developments in the Ag and food sectors that have occurred because of the agreement. In broad terms, the agreement led to increased U.S. exports of grains, oilseeds and meat products, as well as increased U.S. imports of horticultural products and sugar. Horticultural imports led to greater variety and seasonal availability of fresh produce, though they also displaced U.S. production. Cross-border Ag and food supply chains have developed under NAFTA rules, and there have been significant cross-border investments in all NAFTA member countries. Efforts by the NAFTA member countries to coordinate sanitary and phytosanitary (SPS) policies has facilitated cross-

border trade in live animals and in meat products.

The USDA report notes that agricultural trade between the three countries tripled over the first 20 years of the treaty. The report also showed that growth in exports of key commodities to these markets has slowed in recent years. This may mean that most of the adjustment to the provisions of the agreement have

Table I

2016 U.S. export value for selected products and partners (in millions of current dollars)

Product	Canada	Mexico	Rest of World	Total
Corn	146	2,550	7,195	9,890
Soybeans	106	1,461	21,253	22,820
Pork and Pork Products	798	1,360	3,778	5,936
Poultry Meat & Prods. (ex. eggs)	510	931	2,438	3,879
Sub-total	1,550	6,302	34,664	42,525
Total Agriculture and Related products	24,336	18,712	109,254	152,301

Data source: FAS (2017)

already occurred.

The agreement contains provisions for renegotiation and for withdrawal. President Trump considered a complete withdrawal of the United States from NAFTA, but was persuaded to follow the path of renegotiation instead (Donnan and Weber, 2017). It seems likely that unsuccessful negotiations would trigger the President to push for complete withdrawal. U.S. law is not clear on the question of whether the president has the legal authority to withdraw without the consent of Congress. A unilateral effort by the President to trigger withdrawal would likely result in legal action in U.S. courts (Lawder 2017) Another open question is whether U.S. withdrawal would also mean effective withdrawal from the Canada-U.S. Free Trade agreement, which pre-dated NAFTA.

Trade negotiations occur in secret, so it is not possible to know whether agreement is likely. However, the public statements of the negotiators make it seem that consensus will be difficult. U.S. chief negotiator Robert Lighthizer expressed frustration with his counterparts, who were unwilling to concede issues that had been negotiated as part of the Trans-Pacific Partnership prior to U.S. withdrawal (Bown et al., 2017). Canada's top negotiator has called several U.S. proposals in the NAFTA negotiations "unconventional," and argued that some were inconsistent with WTO disciplines (Keynes and Bown 2017). Most of the U.S. demands that Canadian and Mexican negotiators see as beyond-the-pale are oriented towards trade in manufactured goods. One proposal that could turn into a deal killer is the U.S. desire to include a "sunset clause," which would trigger reconsideration of NAFTA commitments at 5-year intervals.

Whether the President's aggressive stance in the negotiations will bear fruit is an open question. As the largest economy in the group, the U.S. may have leverage that it has not fully exploited in the past. However, Canada and Mexico have other good options. They remain members of the recently concluded Trans-Pacific Partnership agreement, for which our President withdrew the U.S. This gives them preferential access to sizable Asian Ag and food markets, most notably Japan's. On the import side, Mexico is negotiating with Brazil and Argentina to replace imports of U.S. corn if the NAFTA talks collapse (Webber, 2017). The disruption that U.S. withdrawal would generate for all the member countries should give the negotiators an incentive to keep talking.

In a review of the specific agricultural issues at play in the negotiations, Hendrix (2017) asks the rhetorical question, "What would a productive renegotiation of NAFTA look like?" His answer includes four issues:

1. Reduce or eliminate nontariff barriers to U.S. agricultural imports, including those affecting new U.S. technologies.
2. Maintain commitments to eliminate export subsidies (while also preserving food aid and export development programs).
3. Seek robust rules governing sanitary and phytosanitary (SPS) provisions that are sometimes used to limit imports of Ag and food products, and
4. Strengthen ongoing cooperation between the agencies that oversee SPS rules in the NAFTA member countries.

Hendrix notes that many of these issues were addressed in the TPP negotiations. The smaller number of negotiating parties in the NAFTA renegotiations may produce a somewhat different outcome.

From the point of view of agricultural producers, one frustration with the way these talks are going may be the U.S. negotiators focus on manufacturing issues. There is room to improve trade relations and boost agricultural trade. However, the U.S. administration's aggressive proposals on manufacturing-oriented trade issues risk derailing these talks. These negotiations will be one of the most critical international trade issues to watch in 2018 and can have positive or large negative impacts on U.S. agriculture depending on the outcome.

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FARM POLICY: PERSPECTIVES ON THE NEW FARM BILL

ROMAN KEENEY, ASSOCIATE PROFESSOR OF AGRICULTURAL ECONOMICS

With the expiration of current farm bill in 2018, Agriculture policy could have numerous important changes for agricultural. Continuing debates on national immigration and health care will have significant impacts on farm operations and households that employ migrant labor or use private insurance markets. Continuing negotiations on the North American Free Trade Agreement (NAFTA) will determine how much access the U.S. enjoys to the increasingly important export demands of our continental neighbors. Any of these issues may have critical bearing on a particular farm family, region, or commodity market. The new farm bill will bring together the varied interests around farm profitability, conservation, and low-income assistance. This article will focus on the discussions and the political compromises that will be needed to form the next farm bill.

Background on the Policy Environment

Both the difficult passage of the 2014 Farm Bill and the difficulties of passing new legislation on health care or taxes during the 2017 calendar year with a single party government are instructive in considering new farm bill legislation. The 2014 Farm Bill replaced its 2008 predecessor only after both the 112th (2011-2012) and 113th (2013-2014) Congresses failed to promptly replace expiring legislation. Farm bill policies in 2013 were maintained through an extension of the 2008 Farm Bill and the February 2014 passage of the farm bill was made retroactive to October 2013’s lapse of the extended 2008 Farm Bill.

The 2014 Farm Bill (and its failed precursors) was notable for the broad legislative agreement to drastically reform the commodity payments system in the US. It dispensed with fixed direct payments to producers in favor of counter-cyclical options that tied payment levels to market performance. However, the total cost of the legislation, particularly the large commitment to nutritional assistance was contentious. As compromise positions moved closer to sustaining funds for nutrition assistance, a portion of the Republican caucus sought to ‘split’ the farm bill into

Zahniser, Steven, Sahar Angadjivad, Thomas Hertz, Lindsay Kuberka, and Alexandra Santos (2015), NAFTA at 20: North America's Free-Trade Area and Its Impact on Agriculture, US. Department of Agriculture, Economic Research Service. Available at <https://www.ers.usda.gov/publications/pub-details/?pubid=40486>.

two pieces, allowing separate legislation for farm support and for nutrition assistance.

The division within the Republican caucus has continued to be on display during the 115th (2017-2018) Congress. Government funding bills have set pragmatists against deficit hawks within the party. Multiple attempts at health care legislation fell short in the 115th Congress despite the use of reconciliation rules that allowed Republican majorities to vote for repeal of the Affordable Care Act (ACA) unabated by the opposition. Tax reform, which like ACA repeal enjoys strong general support in the Republican caucus, has similarly proved difficult to get agreement. Heading into 2018, it is unclear if taxes and health care will remain legislative priorities that consume debate time and crowd out farm bill discussion. What is clear is that the farm bill is set to expire and presents some thorny policy questions that will need to be reconciled.

Farm Bill 2018 Process and Outlook

A number of important questions will surface in the farm bill debate, but if history is any indication the federal budget impact will be front and center. At its passage in 2014, the current farm bill was expected to cost approximately \$490 billion over 5 years. As the economy and employment improved, outlays for nutrition assistance declined and current estimates indicate that the five-year cost may be closer to \$450 billion. Looking ahead, the current set of policies will be used with assumptions about the US economy’s performance to calculate a spending baseline. Figure 1 shows the 2018 – 2027 projected annual spending for the four main cost items (note that Title IV Nutrition is plotted against the right hand vertical axis) in the farm bill.

The projection shows both commodity payments (Title I) and nutrition (Title IV) declining for much of the ten-year projection period. A new March 2018 CBO forecast will replace the current numbers in Figure 1, but is expected to yield a similar budget picture that will require any farm

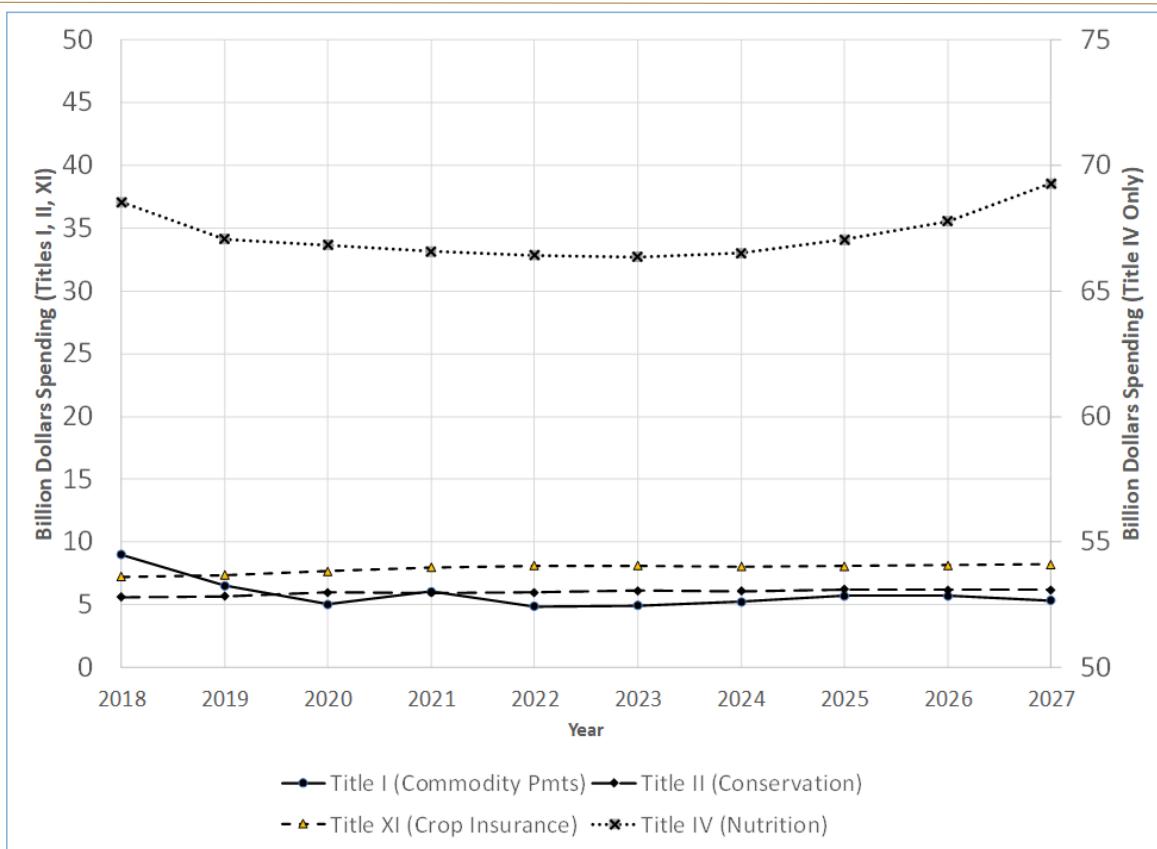


Figure 1. Projected spending on major Farm Bill titles, 2018 – 2027

bill changes to stay within the lower projected costs of continuing the exact policies as enacted in 2014. This pay-as-you-go provision means that in writing the farm bill any increases must be met with offsets in the same legislation to keep the bill on budget.

The nutrition title carries the most budget weight and is the most likely target for smaller spending to reduce the deficit. However, many of the urban district votes cast for the farm bill are primarily earned by the commitment to supporting low-income households through nutrition assistance. Fights over the level of nutrition spending and whether to keep it tied to farm and conservation programs moved to the forefront in the summer of 2013. This led some to speculate that the 2014 Farm Bill could be the last of its kind. The potential to split the farm bill resurfaces regularly in the majority caucus but gaining the votes to pass a standalone farm safety net is not realistic. All of this means the 2018 Farm Bill will most likely be written with a lower spending baseline that will provide limited flexibility to improve farm incomes that are expected to continue to decline.

What avenues exist for reforming the farm bill then? There are a number of options that will likely be pursued subject to the budget constraints.

Both the nutrition and commodity titles have critics that

would like to see targeting of government payments to poorest households and at-risk farm businesses. In a growing economy with strong job creation, efforts to reduce waste or tighten eligibility requirements to qualify for nutrition assistance may find favor. Efforts to means test farm commodity assistance have largely been ineffective, but may be a bargaining chip that earns support from lawmakers that prefer that farm payments function as credible income support rather than market price support.

During 2017 summer listening sessions, a number of priorities for reforming the implementation of 2014 Farm Bill commodity programs surfaced. Foremost among these are the methods of supporting cotton and dairy, two powerful commodity lobbies that have been frustrated by both the domestic farm policy and U.S. trade policy. Traditional row crops in the farm bill have been supported under two alternatives, price loss coverage (PLC) and agricultural risk coverage (ARC).

Farmers were afforded the option of enrolling their crops in either alternative for the life of the farm bill and would likely be handed such an option again. The ARC option has been sharply critiqued for the lack of uniformity in determining county yields as the basis of payments and will likely require direction from Congress to achieve consistency. This may be a relatively minor point if new legis-

lation affords farm operators their choice of program because commodity price outlooks strongly favor more shifting to PLC for payments.

Under the 2014 Farm Bill, payments for crops cannot be made until the end of the marketing year for a particular crop. This significantly delays the receipt of funds to support income in a weak market year. Past farm legislation has featured provisions for partial up-front payments based on estimated prices that could alleviate some of the economic stress fostered by the delay.

Farmers are paid on base acres with a fixed allocation to historically grown crops under both the PLC and ARC programs. The implementation of the 2014 Farm Bill allowed producers to set that allocation using most recent planting information. New farm legislation that allowed a fresh update would allow farms to choose the payment basis that best matches their sources of farm earnings.

Listening sessions and commentary from 2017 have focused very little on the ARC and PLC programs' statutory details that trigger payments. Depending on the budget outlook in March 2018 there may be some room to move statutory support prices to align with market outlook or to make it easier for ARC payments to trigger when prices fall. The final specifics on these programs will be among the last items hammered out as they are balanced to fit into the baseline by adjusting their levels or the number of years that higher support levels are mandated in the ten-year budget window.

Closing Thoughts

In many ways, the 2014 Farm Bill represented a culmination of the long process of codifying Congress' predilection for emergency and disaster assistance to the farm sector. The 1996 Farm Bill's non-belief in current markets or incomes setting payment levels was quickly reversed with

ad hoc emergency payments when commodity markets stumbled. Each successive farm bill since 1996 has favored increased use of counter-cyclical mechanisms that produce the largest transfers to farms in the weakest marketing years. With the 2014 Farm Bill's payments triggered by worsening markets the foundations of commodity support going into 2018 policy discussions seem to be set. Small changes from the 2014 bill are far more likely for primary commodity support. If so, farmers' choices in a 2018 bill may look familiar as they consider the policy and management implications.

Much like the 2012 and 2013 farm bill debate years, the macro-factors of balancing the multiple spending priorities and overall budget effect in a deficit environment are far more uncertain. After a frustrated effort to repeal and replace ACA in the spring of 2017, it seemed like momentum was building for an expedited farm bill to show some progress on the legislative calendar. Discussions of August to October hearings, mark-up, and score fell by the wayside as health care resurfaced alongside funding the government, and tax reform. Thus, no progress was made on the new farm bill.

This sets the stage for 2018 where the prospects of farm bill passage seem increasingly remote. All proposals for tax reform that have been considered to date increase the deficit by at least \$1 trillion over 10 years. The Republican caucus seems committed to cutting the revenue side of government by tax reform, making it more likely that spending authorizations will be reduced in new farm legislation providing an additional challenge to the lingering tensions that inhibited the process five years ago. If time does run out on the 2014 Farm Bill triggering reversion to the various permanent law measures, there is some assurance in the recent experience that a swift extension of current law would keep farmers from dealing with significant uncertainty until replacement legislation can be passed.

LOW FARM PRICES CONTRIBUTE TO MODEST FOOD PRICE CHANGES

JAYSON LUSK, DEPARTMENT HEAD AND DISTINGUISHED PROFESSOR OF AGRICULTURAL ECONOMICS

Last year, 2016, proved to be a record setter, at least in recent history, for food price changes. For the first time in at least three decades, the annual consumer price index for food at home fell. Driven in part by the fall in agricultural commodity prices, prices for food at home fell 1.3% from 2015 to 2016. While prices for food eaten away from home increased 2.6% from 2015 to 2016, this change remained below the twenty-year historical average increase

of 2.7%.

Where are retail food prices in 2017 and beyond? The fall in prices from food at home appears to have abated. Through the first ten months of 2017, prices for food at home increased every month save one (June), but the increases were quite modest – averaging a tenth of a percentage increase each month. Increases in prices of food

away from home through the first ten months of 2017 are similar to that observed during the same time in 2016. The USDA Economic Research Service forecast overall food price inflation of 1% to 2% in 2017 and 1.5% to 2.5% in 2018, with most of the increases coming from changes in prices of food away from home.

The figure below shows the year-over-year monthly changes (for example, the percent change from October 2016 to October 2017) in prices of several food and non-food items. The year-over-year change in the price of food away from home has hovered around 2.5% for the past four years. By contrast, the year-over-year changes in prices of food at home were largely negative in 2016, but

have subsequently trended positive. Similar, though more dramatic, patterns are observable for prices of meat and for fruits and vegetables. Despite the recent increases in prices of food at home, meat, and fruits and vegetables, the increases remain quite modest. In-fact, the year-over-year increases for each of these food items remain below the increases in prices of non-food items, which have averaged about 2% since mid-2016. It is important to make comparisons to changes of non-food prices because it is the relative changes that drive consumer purchase behavior. If the price of non-food items increases at the same rate as food items, one would not expect much change in consumers' food purchases.

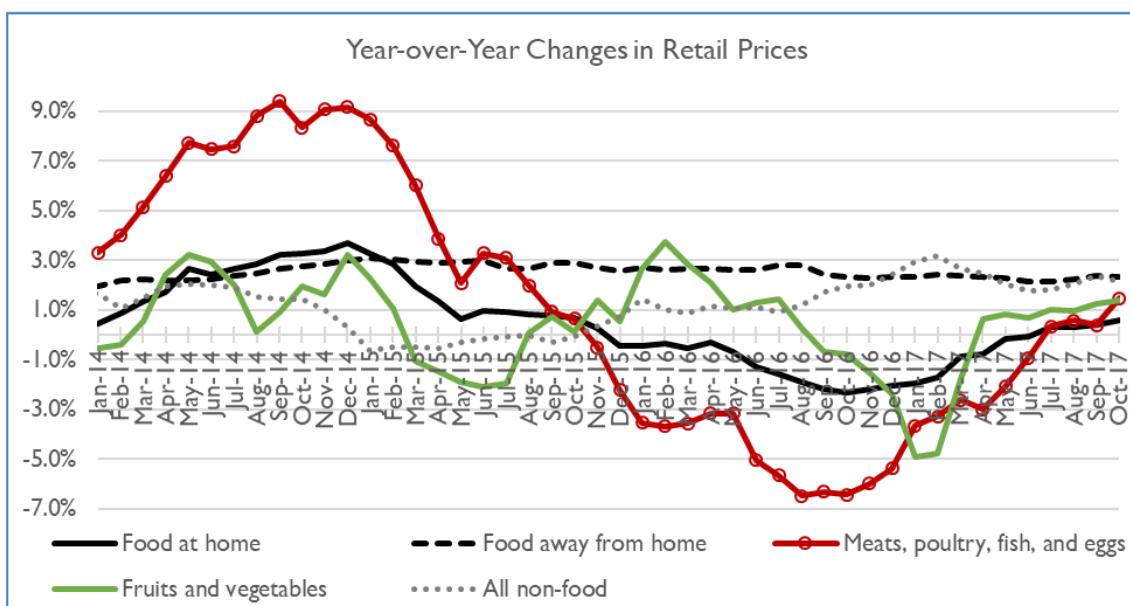


Figure 1. Year-over-year monthly changes in retail prices.

BEEF SUPPLY TO RISE: CAN STRONG DEMAND HOLD CATTLE PRICES

JAMES MINTERT, PROFESSOR AND DIRECTOR OF THE CENTER FOR COMMERCIAL AGRICULTURE

Prices for calves and feeder cattle started 2017 sharply lower than a year earlier but by year-end, prices were well above those of 12 months prior. Examining prices for steer calves and feeder steers in the eastern Corn Belt helps illustrate how large the price swings were over the last 12 months. During January prices for 500-600 pound Kentucky steers averaged just less than \$130 per cwt., 27% below the January 2016 average. However, by late November and early December 2017, prices for the same weight steers had recovered to average in the low \$150s per cwt., more than 20% above a year earlier. Despite the price recovery in late 2017, weakness early in the year led to an annual average price of \$149 per cwt., which was about 3% lower than in 2016.

Prices for heavier weight feeder steers followed a pattern similar to that of steer calves in 2017 with prices for 700-800 pound steers in Kentucky during January averaging near \$121 per cwt., more than 20% below January 2016. But by late November and early December, feeder steer prices recovered to the mid-\$140s, yielding a fourth quarter average nearly 27% higher than a year earlier. For the year, prices for 700-800 pound steers in Kentucky averaged about \$136, just a couple of percent lower than a year earlier.

Prices for slaughter cattle during 2017 were not as volatile as calf and feeder prices, although they did fluctuate during the course of the year. During January, Southern

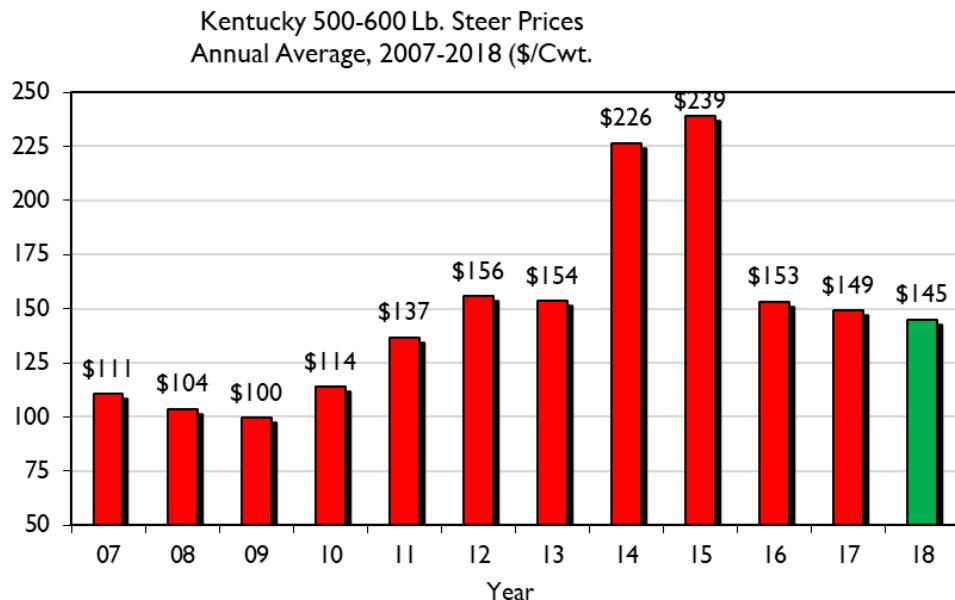
Plains slaughter steer prices averaged just over 10% below a year earlier, but by late November and early December slaughter steer prices averaged about 12% higher than 12 months prior. The result was an annual average slaughter steer price of about \$122 per cwt., virtually unchanged from 2016's annual average.

The weakness in feeder and calf prices in late 2016 and early 2017 helped cattle feeders return to profitability during 2017, a welcome respite from the large

losses many feeders experienced during the prior two years. In fact, Iowa State Extension's estimate of cattle feeding returns rebounded dramatically during the year. Iowa State simulates returns from a stylized feeding program where cattle are placed on feed every month and feed is purchased, and cattle sold, in the cash market without any risk management.

Yearling based and calf based feeding programs were very profitable in 2017 as returns averaged over \$170 per head above estimated costs for both feeding programs. This was a dramatic turnaround from 2016 when estimated losses averaged \$111 per head for yearlings and \$220 per head for calf-based programs. Feeding was especially profitable during the spring and early summer of 2017 when cattle feeders benefitted from marketing cattle that were placed on feed when calf and feeder cattle prices were near their lows and slaughter cattle prices were strengthening. By this fall, however, cattle feeders were struggling to breakeven again. Stronger feeder prices pushed cattle feeders' breakevens up and, although slaughter cattle prices did strengthen seasonally from late summer lows into fall, they did not improve enough to offset the rise in feeder cattle placement costs.

A key driver of beef and cattle prices is the supply of meat, especially beef, available to consumers. Both beef and total meat supplies were larger in 2017 than in 2016, putting some downward pressure on prices. Cattle slaughter during 2017 rose nearly 6% above the prior year, but dressed carcass weights averaged 1.4% below 2016s. The year-to-year reduction in cattle weights held the 2017 U.S. beef production increase to approximately 4% compared



Source: USDA-AMS, 2018 forecast

Purdue Center for Commercial Agriculture

to 2016. Beef supplies available for U.S. consumers, however, did not increase as much as beef production because U.S. beef exports increased 10%, and beef imports actually declined about 2%. The result was only a 2% increase in per capita beef supplies for U.S. consumers at retail.

Likewise, total meat supplies at retail in the U.S. increased less than total meat production because imports declined by 1% and total meat exports increased by over 4%, both compared to the prior year. The result was an increase in total meat (red meat plus poultry) supplies of about 1%. So, international trade in meat clearly benefited U.S. livestock and poultry producers.

What's Ahead in 2018?

Annual cattle slaughter volume bottomed out in 2015 at 29.2 million head and has been increasing since, reaching 32.7 million head in 2017. Another increase in slaughter numbers seems likely in 2018 as the industry is still in the expansion phase of the cattle cycle. Earlier this year, USDA estimated that the January 1, 2017 cattle inventory increased by nearly 2% during 2016, driven in part by a 2016 calf crop that was almost 3% larger than in 2015. What will the upcoming inventory report, scheduled for release by USDA in late January 2018 reveal? One significant clue with respect to what might be revealed on the upcoming inventory report can be found by examining female cattle slaughter relative to steer slaughter during 2017 and prior years.

In years when producers are reducing the size of the U.S. cattle herd, female slaughter relative to steer slaughter rises and, conversely, when herd expansion is underway

female slaughter declines relative to steer slaughter. During both 2015 and 2016 female slaughter averaged near 80% of steer slaughter, indicating expansion was underway. Female slaughter did accelerate this year in response to lower calf prices and reduced returns to cow-calf operations. However, the female to steer slaughter ratio only climbed to 86%, suggesting expansion slowed, but did not stop. So, odds are good that we will see another increase in the size of the U.S. herd when USDA releases its next inventory estimate in late January 2018 and that suggests cattle slaughter and beef production in 2018 will both increase compared to 2017.

The year-to-year increase in cattle slaughter in 2018 is likely to be smaller than in 2017, perhaps falling in a range of 3% to 5%. Unlike 2017, dressed cattle weights are likely to equal or exceed the year ago level leading to a larger increase in beef production than cattle slaughter. However, an improvement in the beef trade balance could help hold back domestic beef supplies somewhat, leading to an increase in per capita retail beef supplies that's actually smaller than the expected increase in cattle slaughter. Total meat supplies facing consumers at the retail case are

expected to rise between 1% and 2%, compared to 2017. If incomes continue to grow, demand strength could compensate for most of the expected meat supply increase, however, alleviating downward pressure on retail meat prices.

What's ahead in 2018? Modest increases in both beef and total meat supplies mean prices for slaughter steers in the Southern Plains during 2018 are likely to average near or perhaps a bit lower than 2017's average of \$122 per cwt. If slaughter cattle prices soften modestly as seems likely, it will put some downward pressure on calf and feeder prices, but the decline in the 2018 annual averages could be small. Look for the annual average for 500-600 pound steers in Kentucky to average in the mid-\$140's in 2018 with prices for 700-800 pound feeder steers in Kentucky expected to average in the low to mid-\$130s. Herd expansion showed signs of slowing down during 2017. The big question is whether U.S. cow-calf operations choose to remain on their expansion path in 2018. Conditions in 2018, including weather, grain prices and forage availability, could provide the keys to future herd growth.

DAIRY: "BUTTER" HOLD ON: TIGHT MARGINS CONTINUE!

NICOLE OLYNK WIDMAR, PROFESSOR OF AGRICULTURAL ECONOMICS
COURTNEY BIR, Ph.D. CANDIDATE AND RESEARCH ASSISTANT

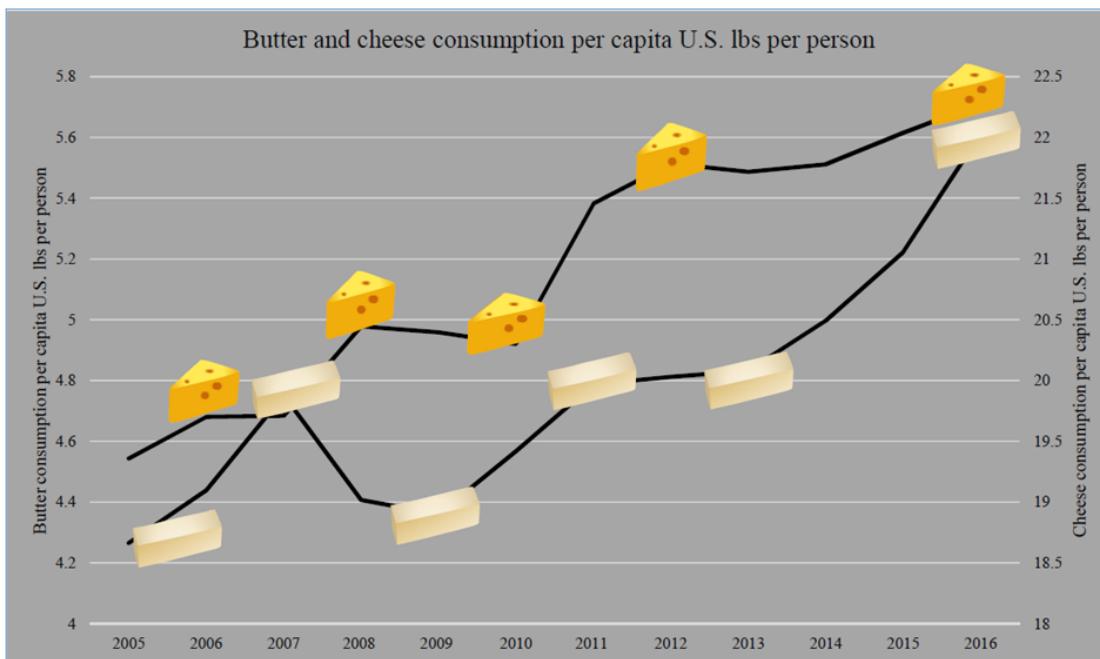
The hoped for prospects for milk price improvements are simply not materializing. Milk prices are looking like more of the same, with some downward pressures, if anything. The usual milk market factors of interest, including the number of milk cows, total milk production, stocks, and trade do not offer much hope of improved prices. Milk production continues to increase year after year. This year the US is expected to produce a new record, 217 billion lbs. Cow numbers are also at a record high of 9.4 million, with record production per cow. The cowherd has expanded by 50,000 head between December and June and productivity has improved by 1%. On the other hand, slaughter was up 4% from January – August 2017 and was on track to be the largest since 2013.

Stocks on a milk-fat basis remain high as seasonal consumption patterns have been lower than historical averages. In particular, exports of butter and cheese have been weaker than expected. Fluid milk sales volume was down 2% from the previous year in July, resulting in more milk available for cheese, butter, powder and other markets.

Butter is the hottest dairy commodity with American's consuming 20% more butter per person when compared to 2000, and 8% more than last year. Butter inventories have been decreasing due to increasing demand, and were down 12% in August when compared to the previous year. However, recent downward price pressures and high global stocks have sent fourth-quarter 2017 prices lower for butter, as well as non-fat dry milk and whey. Cheese and powder inventories are at historically high levels. Pizza cheese (mozzarella) has been an increasing product of the dairy industry with exports now accounting for 7% of the U.S. production last year. Cheese prices were raised for the fourth quarter, a reflection of recent price strength.

Price declines for most dairy products in domestic and international markets have led to lower expectations for the 4th quarter 2017 all-milk price forecasted at \$17.75–\$17.95 per cwt.

The all-milk price for 2018 is now forecasted by USDA to be \$0.80 per cwt lower than 2017 at the midpoint of their range. Prices are expected to be \$16.65 to \$17.45 for



A look at changing per capita cheese and butter consumption in the United States.

Data Sources: USDA National Agricultural Statistics Service, USDA Farm Service Agency, USDA Foreign Agricultural Service, USDA Agricultural Marketing Service, U.S. Department of Commerce Bureau of the Census, California Department of Food and Agriculture, USDA Economic Research Service calculations. Graphic developed by Courtney Bir, 2017.

2018.

Milk margins have seen some improvement as harvest has bolstered on-farm feed supplies and feed costs are relatively low. The main driver of higher margins is high crop yields. Corn crops are yielding high silage tonnage, and

the USDA reports stocks of soybeans are much higher than last fall. The 2017/18 USDA price forecast for corn is at \$2.85-\$3.55 while the soybean meal price is forecast at \$295-\$335 per short ton as of the December update.

PORK INDUSTRY FAVORED BY STRONG 2018 DEMAND

CHRIS HURT, PROFESSOR OF AGRICULTURAL ECONOMICS

Pork production increased by 3% in 2017, but hog prices were about 10% higher, averaging near \$51 per live hundredweight. Stronger prices with higher production is generally an indication of strong demand. Strong pork demand is expected to continue in 2018 and will hold, or modestly strengthen, 2018 hog prices even with stepped up production.

The higher hog prices are due to consumer demand. U.S. economic growth in the third quarter reached 3.3% with the lowest unemployment rate since 2000. Strong income growth with more people working improves the consumption of meats, including pork. The 2018 outlook is for continued income growth and even lower unemployment. In addition, higher stock and housing values tend to cause consumers to spend more freely as well.

Pork is growing in popularity with our foreign customers.

The world economy in 2018 is expected to have its strongest year since the 2008-2009 recession. In 2017, pork exports were up 7% and net trade (exports minus imports) was up 9%. U.S. pork production was up about 2.5% in 2017 but the more positive trade balance means that U.S. consumers have only 1% more pork available. With domestic population expanding by near 1%, this means that pork available per person in 2017 was about the same as 2016.

Mexico is the biggest reason for increased 2017 exports. The volume of Mexican pork purchases surged above Japan in 2015 to become our number one export destination. Since then, Mexico has continued to put Japan in the rear-view mirror. In 2017 to-date, the volume of Mexican pork purchases have exceeded Japan by 45%. South Korea, our fourth largest buyer has increased the volume of pork pur-

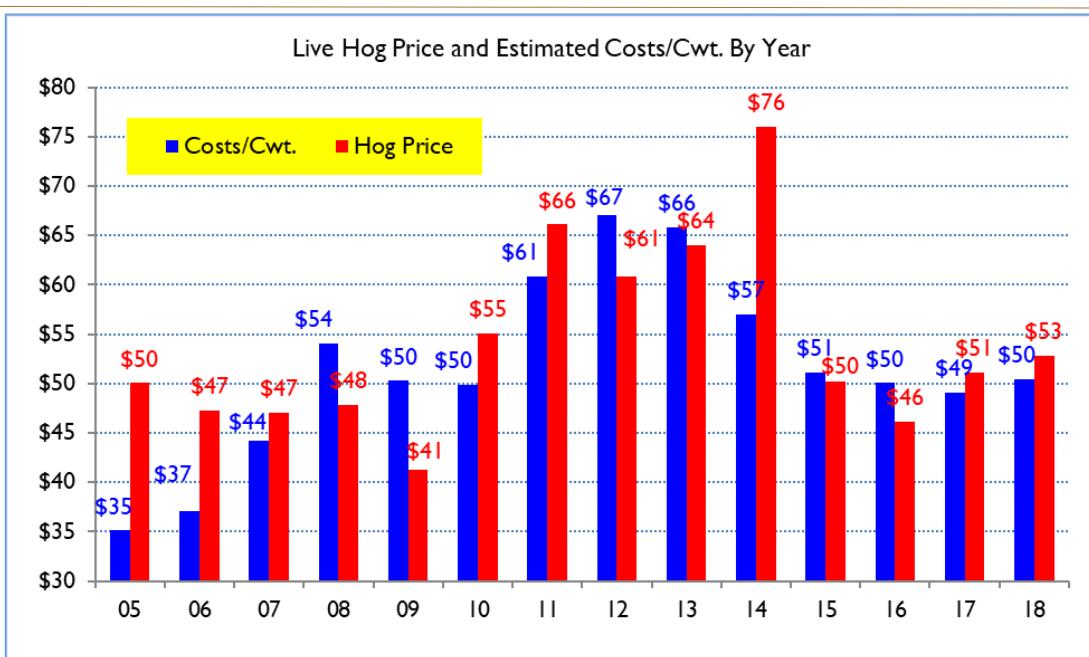
chases from the U.S. in 2017 to-date by 18%. The export market looks strong for 2018 with USDA analysts suggesting an additional 6% rise. A positive outcome to NAFTA negotiations are vital to the pork industry.

Increased packer capacity began to reduce packer margins in August 2017 as new capacity began to come on-line. Lower packer margins can mean that more value is bid into the producers' hog price. In October, the packer margin, as reported by USDA, fell to 48 cents per retail pound compared to 79 cents per retail pound one year earlier. In 2018, these new plants are expected to continue to expand processing numbers as they work toward full capacity. This will likely continue to be supportive to producer prices.

Live hog prices in 2016 averaged about \$46 per live hundredweight and near \$51 for 2017. The lean futures market, at this writing, is optimistic for a similar outcome in 2018 suggesting that live prices may average about \$51 to \$53 in 2018. My estimates are for pork supplies to rise around 2.5% in 2018 and if hog prices do rise again, it will most likely be due to positive demand factors.

Feed cost are expected to rise modestly in calendar year 2018 with corn prices up about 15 cents per bushel and meal up about \$15 per ton compared to calendar 2017.

Estimated total costs of production will increase from around \$49 in 2017 to a bit over \$50 for 2018. With moderate feed costs and a low general inflation rate, estimated



annual total production costs have been near \$50 for the most recent four calendar years from 2015 through 2018. This narrow cost range is dramatically different when compared to the nine years from 2005 through 2013 when my estimated annual costs ranged from \$35 per live hundredweight to \$67.

For 2018, the current outlook is for positive returns above all costs. The level of positive returns is expected to be in the range of \$5 to \$8 per head for both 2017 and 2018.

The pork industry has been in expansion since 2014 when the PED virus helped send hog prices to record highs and feed prices dropped sharply. The pace of that expansion has been reasonably controlled and orderly. Annual expansion of 2.5% per year can be sustained as long as domestic demand remains strong and export demand grows by 5% or more. However, the industry could return to losses if expansion grows by more than 2.5% or the current strong demand drivers should falter.

CORN PRICES DEPRESSED BY LARGE INVENTORY

CHRIS HURT, PROFESSOR OF AGRICULTURAL ECONOMICS

National corn yields were at record high levels of 175.4 bushels per acre according to USDA. U.S. corn yields have set new records in three of the past four years. Even though corn acreage was down in 2017, the record yields mean that the U.S. produced more corn than will be consumed with ending stocks rising to near 2.4 billion bush-

els. Unfortunately, ending stocks for the 2017/18 marketing year will rise for the fifth consecutive year. As a result, marketing year average prices are expected to be the lowest in 11 years dating back to the 2006 crop.

Indiana yields at 181 bushels were 8 bushels higher than last year and the second highest on record according to

USDA estimates. The strongest yields relative to trend were in the southern third of the state followed by the northern third. Yields in the central third of Indiana were near average.

Prices for the 2017 crop are expected to be down. USDA says the U.S. marketing year average (MYA) price was \$3.36 per bushel for the 2016 crop and will fall to an estimated \$3.20 for the current 2017 crop. In Indiana, farmers marketed the 2016 crop at an average of \$3.63. Average Indiana prices for the 2017 crop are expected to be around \$3.40 to \$3.50.

With the large inventories, it will be difficult for corn usage to rise enough to generate strong price rallies. Rather it is recommended that producers keep their rally objectives moderate. Corn prices this winter may find a trading range of about 25 to 35 cents per bushel. Pricing at the high end of that range is the objective.

With large inventories, the market is providing strong price incentives to store into the late spring and early summer. The goal is to earn as much of these premium prices as possible and also cover storage cost. Price premiums for early-summer delivery are expected to be about \$.30 to \$.32 higher than nearby bids. This is composed of

about \$.16 premium for July futures over the March futures and an expected \$.15 better basis. If on-farm storage costs to next June is \$.08 per bushel this premium price of \$.31 would provide a \$.23 per bushel net return to on-farm storage.

Most do not want to price corn at current low levels but want to wait for that potential \$.20 to \$.30 rally. If that occurs, then they would price but for early-summer delivery. Three ways to do that are: 1.) Sell July 2018 futures and wait for basis improvement, 2.) Do a Hedge-to-Arrive contract at the buyer where they sell July futures for your account, 3.) Sell a cash forward contract if futures and basis are acceptable. Regardless, remember that waiting for higher prices before selling involves the risk that corn prices could still go lower.

The dismal current corn prices and anticipation of poor returns to corn in 2018 will likely begin to shift some acreage out of corn around the globe. As a result, corn prices may begin to improve for the 2018-2019-2020 crops. At this point, it appears that 2017 corn prices may well be the lowest marketing year average for the 14 crop years from 2007 to 2020.

SOYBEANS PAY BILLS WITH FRIENDLY PRICE TONE

CHRIS HURT, PROFESSOR OF AGRICULTURAL ECONOMICS

Soybeans have generally been superior to corn in paying the bills in recent years. Yields have been strong and the opportunity to sometimes price at \$10 a bushel or higher has provided strong revenue, plus direct costs for beans are much lower than for corn.

National soybean yields were 49.5 bushels per acre for the 2017 crop, well above trend, but down 2.5 bushels from the 2016 record. In Indiana, yields were a strong 55 bushels, but down 2.5 bushels from the 2016 record.

The USDA estimate of the U.S. marketing year average (MYA) price at \$9.30 is down from \$9.47 for the 2016 crop. Indiana farmers averaged selling their 2016 crop at \$9.69 and that could be more like \$9.45 to \$9.60 for the 2017 crop. Lower Indiana yields and somewhat lower prices will mean lower soybean revenues compare to the 2016 crop.

While corn prices are buried under large inventories, soybeans are in better shape. Increased purchases this market-

ing year from China, or reduced yields in South America could both provide soybean price recovery. The current La Niña weather pattern is expected to continue through the winter and into spring. La Niña's have a tendency to cause dry weather in Argentina and that is now the case. Argentina is the third largest soybean exporter, but the largest exporter of meal and oil products. Reduced production there would stimulate U.S. soybean and product exports.

Like the corn market, soybeans have sizable price premiums for delivery into the late spring and early summer. The July futures are about \$.30 higher than the January and basis appreciation may be about \$.20. This means the potential to earn about \$.50 higher prices for delivery into early next summer.

The objective is to price beans for delivery into early summer starting with the July 2018 futures around \$10.30 to \$10.40 a bushel and then adding more bushels around \$10.60. This will provide cash prices over \$10 for early-

summer delivery. At this writing, July futures had reached this initial level. It may be important to have specific price thresholds in mind. When markets have large inventories, prices may touch objectives and back down quickly.

Unfavorable weather in South America would likely have more upward price impact on soybeans than corn. World yields have been strong for corn, soybeans and wheat over the past four years. Some would argue the world is due for a production setback. Just the potential for lower yields

will probably help support soybean prices into the winter.

New crop soybean prices once again seem to suggest that market prices are bidding for more soybean acres and less corn and wheat. Somewhat higher U.S. acreage in soybeans in 2018 will moderate price recovery for 2018 crop beans. Nevertheless, even with this anticipation, futures markets are suggesting 2018 soybean prices will be \$.30 to \$.40 higher than the 2017 crop.

2018 PURDUE CROP COST AND RETURN GUIDE

MICHAEL LANGEMEIER, PROFESSOR OF AGRICULTURAL ECONOMICS
CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS

The 2018 Purdue Crop Cost and Return Guide, which is available for free download from the Center for Commercial Agriculture website, gives estimated costs for planting, growing and harvesting corn, soybeans, and wheat, as well as estimated contribution margins and earnings. The guide is updated frequently as grain futures prices change and the costs of inputs, such as seed, fertilizer, pesticides and fuel fluctuate. This article discusses estimates made in late November 2017. The guide presents cost and return information for low, average, and high productivity soils. The discussion in this paper however will focus on the estimates for average productivity soil.

Table 1 presents crop budget information for continuous corn, rotation corn, rotation soybeans, wheat, and double-

crop soybeans for average productivity soil. Double-crop soybeans are typically planted after wheat so it is typical to combine the contribution margin for these two crops when comparing to continuous corn, rotation corn, and rotation soybeans. It is important to note that crop yields have been modified in this year's guide. The current yield estimates reflect trend yields for Indiana for each crop.

The contribution margin, obtained by subtracting total variable cost from market revenue, ranges from \$156 per acre for continuous corn to \$285 per acre for wheat/double-crop soybeans (\$139 for wheat plus \$146 for double-crop soybeans = \$285). The contribution margins for rotation corn and rotation soybeans on average productivity soil are \$208 and \$264 per acre, respectively. It is important to note that the contribution margin is used to cover overhead costs such as machinery costs, family and hired labor, and rent. Failure to cover these overhead costs typically puts downward pressure on cash rent.

From 2010 to 2013, the contribution margin for rotation corn was higher than the contribution margin for rotation soybeans. The average difference in the contribution margin was \$49 per acre higher for corn during this period. The situation since 2014 has been considerably different. The average difference in the contribution mar-

Table I. 2018 Purdue Crop Budget for Average Productivity Soil.

	Continuous Corn	Rotation Corn	Rotation Soybeans	Wheat	Double-Crop Soybeans
Expected Yield per Acre	162	172	53	76	37
Harvest Price per Bushel	\$3.60	\$3.60	\$9.70	\$4.30	\$9.70
Market Revenue per Acre	\$583	\$619	\$514	\$327	\$359
Less Variable Costs per Acre					
Fertilizer	112	103	43	67	32
Seed	111	111	67	44	78
Pesticides	60	60	65	25	55
Dryer Fuel	38	31	0	0	5
Machinery Fuel	18	18	11	11	8
Machinery Repairs	22	22	18	18	15
Hauling	16	17	5	8	4
Interest	12	11	7	6	7
Insurance and Miscellaneous	38	38	34	9	9
Total Variable Costs per Acre	\$427	\$411	\$250	\$188	\$213
Contribution Margin per Acre	\$156	\$208	\$264	\$139	\$146

See ID-166-W for more detail, November 2017 Estimates.

gin since 2014 has been an advantage to soybeans of about \$88 per acre.

Figure 1. Fertilizer, Seed, Pesticide, and Cash Rent Cost per Acre, Rotation Corn in Indiana.

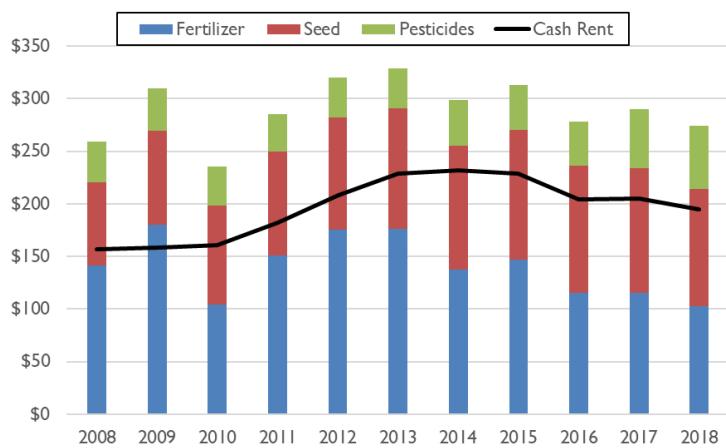


Figure 1 illustrates the trends in fertilizer, seed, pesticide, and cash rent costs for rotation corn on average productivity soil from 2008 to 2018. Fertilizer cost peaked in 2013 at \$176 per acre (\$1.08 per bushel). In 2018, fertilizer cost per acre is projected to be \$103 per acre (\$0.60 per bushel). Cash rent per acre peaked in 2014 at \$232 per acre (\$1.42 per bushel). At \$195 per acre (\$1.13 per bushel), projected cash rent is \$37 per acre (\$0.29 per bushel) lower than it was at the peak in 2014. Partially due to resistant weed problems, pesticide cost per acre in 2018 is expected to be higher than its level in 2013 and 2014, the peak cost years for fertilizer cost and cash rent.

Gross revenue (market revenue plus government payments), variable cost, and overhead cost per acre for rotation corn on average productivity soil is illustrated in Figure 2. Variable cost per acre peaked in 2013 at \$462 per acre (\$2.83 per bushel), and is projected to be \$411 per acre (\$2.39 per bushel) in 2018. Fixed cost (overhead

cost) per acre peaked in 2015 at \$375, and is projected to be \$332 per acre in 2018. The breakeven price needed to cover variable and fixed costs varied from \$4.77 to \$4.98 per bushel from 2012 to 2015. In 2016 and 2017, the breakeven price declined to approximately \$4.55 per bushel. The projected breakeven price for 2018 is \$4.32 per bushel. Gross revenue for rotation corn has declined from \$945 per acre in 2013 to \$619 per acre in 2018. The expected loss per acre for rotation corn in 2018 is \$124 per acre.

Figure 3 illustrates the trends in fertilizer, seed, pesticide, and cash rent costs for rotation soybeans from 2008 to 2018. Fertilizer cost and cash rent have declined since their peaks in 2013 and 2014. Resistant weed problems have put upward pressure on pesticide cost for rotation soybeans.

Figure 3. Fertilizer, Seed, Pesticide, and Cash Rent Cost per Acre, Rotation Soybeans in Indiana.

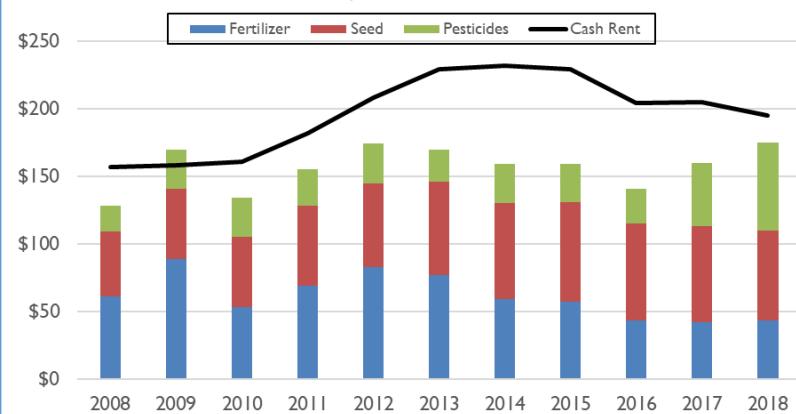
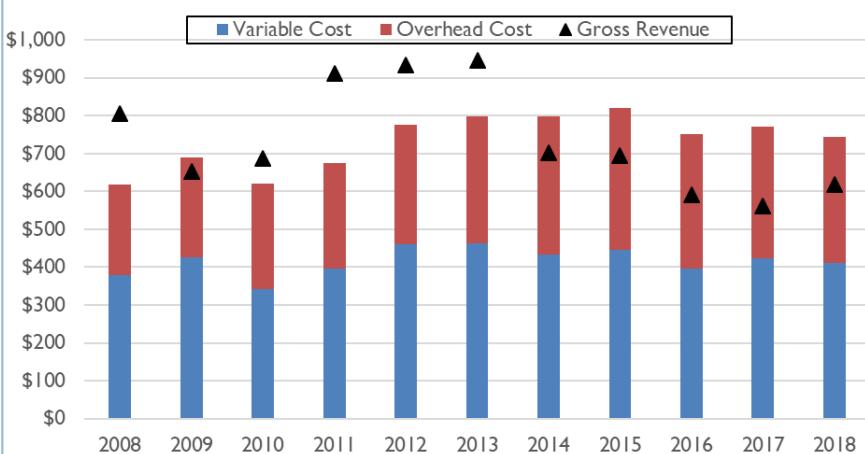


Figure 2. Variable Cost, Overhead Cost, and Gross Revenue per Acre, Rotation Corn in Indiana.

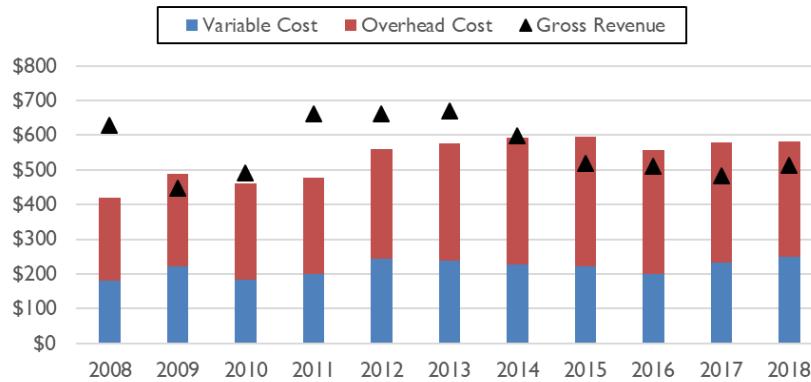


Gross revenue (market revenue plus government payments), variable cost, and overhead cost per acre for rotation soybeans on average productivity land is illustrated in Figure 4. Primarily due to higher herbicide cost, variable cost per acre in 2018 is projected to be

\$250 per acre (\$4.72 per bushel), which is higher than the previous peak in 2013 at \$243 per acre (\$4.50 per bushel). Like corn, fixed cost per acre peaked in 2015 at \$375, and is projected to be \$332 per acre in 2018. The breakeven price needed to cover variable and fixed costs declined from \$11.94 per bushel in 2015 to \$10.98 in 2018. Gross revenue for rotation soybeans has declined from \$670 per acre in 2013 to \$514 per acre in 2018. The expected loss in 2018 for rotation soybeans is \$68 per acre.

The breakeven prices for rotation corn and rotation soybeans discussed above were for

Figure 4. Variable Cost, Overhead Cost, and Gross Revenue per Acre, Rotation Soybeans in Indiana.



average productivity land. For high productivity land, the breakeven prices for rotation corn and rotation soybeans are expected to be

\$3.96 and \$10.19 per bushel, respectively. The breakeven prices for low productivity land are expected to be \$4.78 and \$12.26 per bushel for corn and soybeans, respectively. Thus, unless prices rise above \$3.96 per bushel for corn and \$10.19 per bushel for soybeans, earnings per acre will be negative for low, average, and high productivity levels.

In summary, margins will be tight again in 2018. This increases the importance of carefully evaluating input and crop decisions. Producers are encouraged to create crop budgets and in general improve their record keeping. Lower crop margins will adversely impact a farm's liquidity position and financial performance.

CASH RENTS: PRESSURE IS DOWNWARD

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS

In order to maintain a viable business, operators have been working to reduce the per bushel cost of production. Reducing cash rents and other crop production cost is often a slow process. The outlook for crop costs and returns indicates operators have been working to lower per bushel production cost since 2013. In 2013, the variable cost per bushel of corn on average quality farmland was \$2.83. The projection for 2018 indicates the variable cost per bushel has declined to \$2.39 per bushel. This is about a 16% reduction. Reductions to cash rent have also occurred. In 2013, cash rent per bushel of corn was \$1.43. For 2018, our projected per bushel cash rent is \$1.13, a reduction of 21% from 2013.

Are these adjustments sufficient? Are cash rents in 2018 likely to reflect the stability indicated by the [2017 Purdue Farmland Value Survey](#)? Table 1 provides estimates of the earnings for a 3,000-acre corn and soybeans farm. The contribution margin represents the difference between gross revenues and total variable cost. Yields for the first

three years of estimates are the state average yield reported by the National Agriculture Statistics Service, USDA. The 2018 yield is the trend line yield used in the [2018 Purdue Crop Cost & Return Guide](#). Prices for corn and soybeans in 2015 and 2016 are the marketing year average prices. Price projections for 2017 & 2018 are from the crop guide. Variable costs, operator labor, and machinery overhead are from the crop guide. Cash rent for 2015, 2016 and 2017 are the statewide average for average quality land reported in the Purdue Farmland Value Surveys. The 2018 cash rent is an estimate.

The contribution margin is total gross revenues less variable costs. This margin is the amount of gross revenue remaining to pay the resources of operator labor, machinery, and land or cash rent. The cost estimates for these resources indicate an estimate of the payment required to keep these resources in their current use. The negative earnings indicate there is not enough income to compensate these resources at the estimated cost. It also indicates

continued pressure to lower per bushel production costs or increase revenue. The larger negative values for 2018, indicates this pressure is increasing rather than declining.

The 2018 expected corn and soybean contribution margin at \$236 per acre is smaller than in 2017.

Table I

Estimated earnings for 2015, 2016, 2017, & 2018 from a 3,000-acre corn and soybean farm

	2015	2016	2017	2018 Estimate
Contribution Margin	\$239	\$314	\$273	\$236
Operator Labor & Machinery Overhead	\$131	\$142	\$139	\$137
Cash Rent	\$229	\$204	\$205	\$193-\$199
Earnings	(\$121)	(\$32)	(\$71)	(\$94) - (\$100)

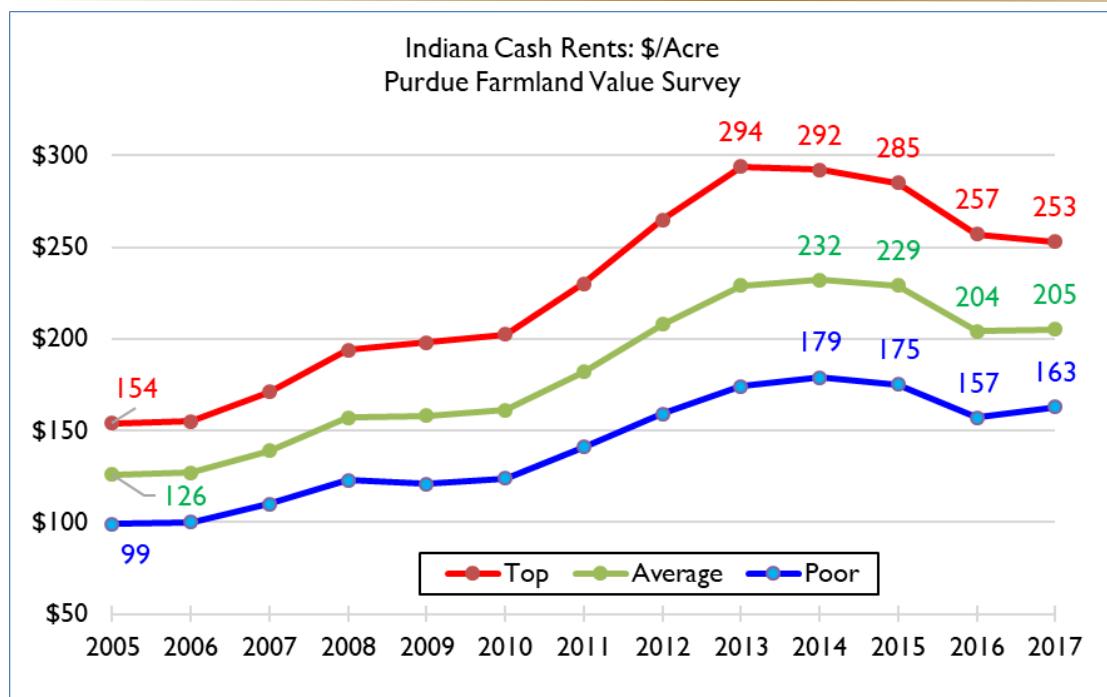
This reduction in margin arises from 2018 trend yields being below 2017 yields and increasing crop protection costs related to weed resistance. An additional consideration when comparing the 2018 contribution margin with 2015 and 2016 is the loss of government support payments after the 2016 crop.

Given the economic pressures at this time, 2018 cash rent is expected to be lower. Periods of declining cash rent are historically rare. The better than

expected yields for many producers in 2017 will provide support for stable cash rents, but continued low crop prices indicate producers need to continue all efforts to reduce costs. Anticipated cash rents in 2018 will be 3% to 6% lower than in 2017. Even with this reduction which is already built into numbers in Table 1, estimated earnings associated with rented land will be more negative than in 2017.

Using futures markets to look beyond 2018, the market anticipates corn prices will move towards \$4.00 while soybean prices will remain flat. These price movements will generate more revenue for a corn and soybean rotation, but at current production cost, earnings continue to be strongly negative. In other words, looking for ways to reduce the cost of production will need to continue.

The budget numbers presented here do not represent a



specific farm. It is always important to know what numbers represent your situation in order to establish an equitable cash rent. In the current economic environment, contribution margins (revenues minus direct costs) are small. If cash rent is less than the contribution margin, the difference that remains helps to pay overhead and operator labor costs. Then the loss minimization strategy would be to continue farming the farm.

However, if the cash rent is more than the contribution margin, there is no positive contribution associated with renting the land. With cash rent larger than the contribution margin, the loss minimization strategy is to stop renting the farm. Releasing a rented farm is a difficult decision, but continuing to farm land that will not pay the rent only contributes to lower profitability. Terminating the lease for farms of this type can help reduce operating losses and lower financial stress.

FARMLAND VALUE OUTLOOK

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS

Average quality Indiana farmland reached a peak of \$7,976 per acre in 2014. The 2017 Purdue Farmland Value Survey indicated average quality farmland was valued at \$6,928 per acre, 13% less than the peak value and 1.6% less than the June 2016 value. The primary force behind the decline of farmland value has been the decline in cropping profitability. In 2014, the Purdue Crop Guide indicated a contribution margin of \$345 for corn and \$395 for

soybeans or \$370 for a corn-soybean rotation. The contribution margin represents the amount of revenue remaining to pay the overhead or fixed costs of unpaid owner labor, machinery and facilities overhead.

As Indiana farmers move into 2018, higher than expected 2017 yields surprised many producers, but grain prices remain at low levels. While there have been some downward adjustments in the cost of inputs, input prices have

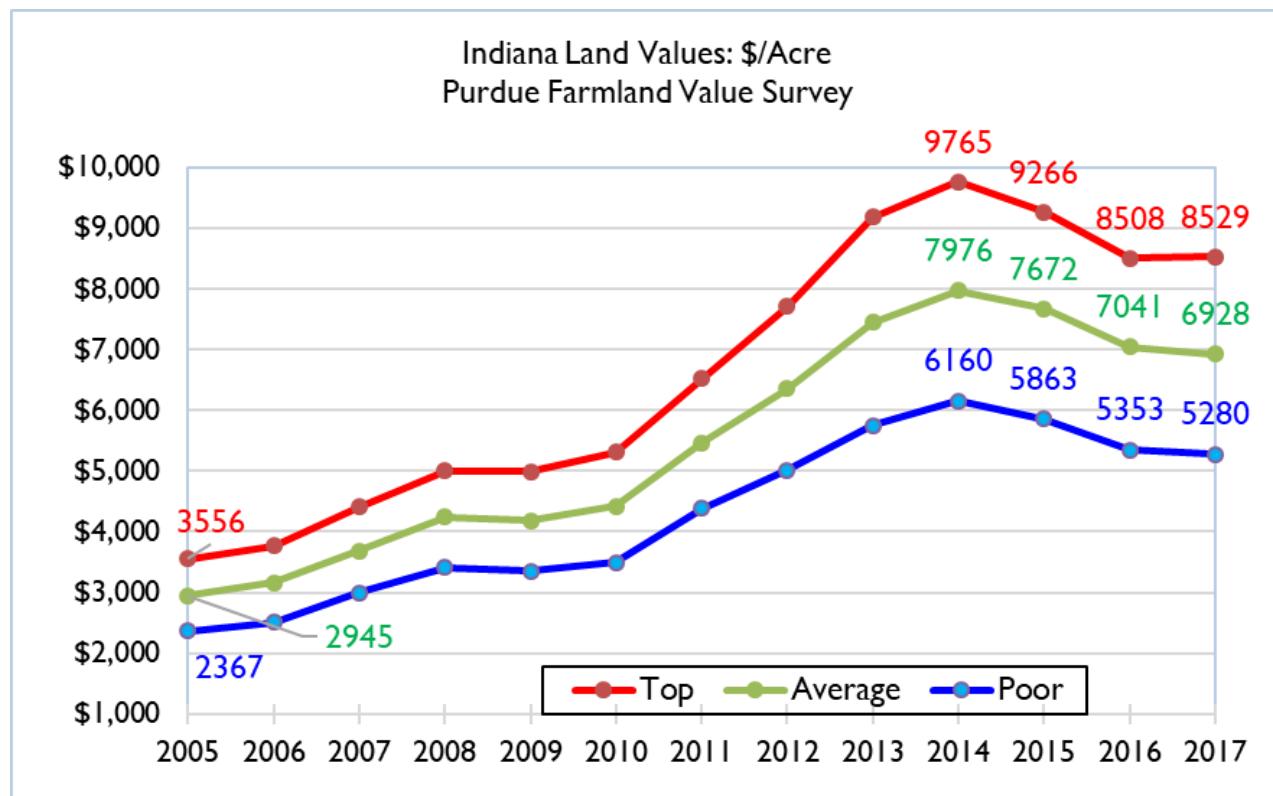
been slow to reflect the lower grain prices. With abundant corn harvests of 2016 and 2017 corn stocks have been rising. Barring an unexpected supply disruption in 2018, it seems unlikely corn and soybean prices will be significantly higher. The [2018 Purdue Crop Cost & Return Guide](#) projects the corn contribution margin to be \$208 per acre while the soybean contribution margin is \$264 per acre or for a corn soybean rotation \$236 per acre. Over the years from 2014-2018, the contribution margin has declined 33%. If the percentage of the contribution margin allotted to land remains the same as 2014, the amount going to farmland today would be 33% less. Capital asset pricing theory indicates a 33% reduction in long-term income generated by farmland results in a 33% decline in farmland value.

While the decline in income generated by farmland is a strong negative influence on farmland values, other factors influence farmland values. Low long-run interest rates continue to be supportive but the Fed has begun to raise interest rates. As these higher rates spread through the economy, this will create resistance to higher farmland values.

Farmland is still viewed by many as a good long-term in-

vestment. There are a number of potential buyers both inside and outside agriculture. The supply of land being brought to market continues to be in balance with the demand; both have declined. One of the important dynamics of the farmland market decline in the 1980s was the excess supply of farmland on the market because of the high foreclosure rate. The presence of an excess supply of farmland is not present in this period of farmland value decline. Producers continue to look for ways to lower the per bushel direct and fixed costs of producing corn and soybeans. Increasing the acres farmed (farm consolidation) through purchase is a common occurrence. Finally, there are still buyers in a strong cash position, but fewer are likely to be farmers.

Some state surveys are finding small increases in farmland values, perhaps indicating the downward adjustment is slowing or even ending. The 2017 Purdue Land Value Survey indicated a bit of stabilization in farmland values but there were still significant reductions in areas of the state. The continued tight margins in crop farming combined with slowly rising long-term interest rates is expected to favor a continuation of the downward price movement. For 2018, it seems Indiana farmland values are likely to decline another 5% to 10% from 2017 levels.



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